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REMARKS

Claims 1-3, 7, 9, 13, 17, 19-20, 22, 28, 30-31, 36-38, and 43 are amended hereby. Claims 35 and 42 were canceled previously. No new claims are added or are canceled. Accordingly, after entry of this Amendment, claims 1-34, 36-41, and 43-44 will remain pending. Currently, claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are being examined. Claims 4-6, 8, 10-12, 14-16, 18, 21, 23-26, 29, 32-34, 39-41, and 44 have been withdrawn from consideration at this time.

In the Office Action dated July 3, 2006, the Examiner rejected claims 31, 36-38, and 43 under 35 U.S.C. § 102(e) as being anticipated by Carducci et al. (U.S. Patent Application Publication No. 2003/00337880). Claims 1, 7, 9, 17, 19, and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okase et al. (U.S. Patent No. 6,228,173) in view of Lingampalli (U.S. Patent No. 6,632,325). The Examiner also rejected claims 2, 20 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Okase et al. in view of Lingampalli and further in view of Imafuku et al. (U.S. Patent Application Publication No. 2004/0083970). Next, claims 3 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okase in view of Limgampalli and further in view of Carducci. The Examiner also rejected claims 28 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Okase in view of Lingampalli and further in view of Perlov et al. (U.S. Patent Application Publication No. 2002/0170672). As these are essentially the same rejections asserted previously, the Applicant respectfully maintains disagreement with the rejections and, therefore, respectfully traverses the same.

In the Office Action, at paragraph #2 on pages 9-10, the Examiner stated that the structure 68 in Okase et al. is a protective barrier formed on at least a portion of the interior surface of the processing chamber and attached by the frame 70. The Examiner further stated that the term "protective barrier" can be interpreted to be a structure itself that forms a protective barrier. The Examiner added that the Applicant appears to be directing arguments to a protective film/layer deposited on a surface of a chamber structure. The Examiner noted, however, that this is not what is claimed.

In response to this statement, the Applicant has amended the claims currently being examined to clarify the meaning of the claims by specifying that the protective barrier is a protective barrier layer.

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Turning to the rejections asserted by the Examiner, the Applicant respectfully submits that claims 31, 36-38, and 43 are not anticipated by Carducci et al. because the claims have been amended to recite a chemical treatment system comprising, among other features, a protective barrier layer formed on at least a portion of an interior surface of the treatment chamber, the protective barrier layer comprising at least one of Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. Carducci et al. does not describe at least these features. As a result, the reference does not describe each and every feature as recited by the claims and, therefore, cannot be relied upon to anticipate the claims. At least for this reason, the Applicant respectfully requests that the Examiner withdraw the rejection under 35 U.S.C. § 102(e).

As noted by the Applicant in the response filed on April 10, 2006, Carducci et al. describes a dielectric etch chamber with an expanded process window where the processing chamber 100 includes a chamber liner 104, illustrated as a first liner 134 and a second liner 118, disposed adjacent to the walls 106, 108 and the lid 102. (Carducci et al. at paragraph [0055].) The first liner 134 is fabricated from a thermally conductive material such as anodized aluminum, stainless steel, ceramic, or other compatible material. (Carducci et al. at paragraph [0080].) The second liner 118 is fabricated from a thermally conductive material such as anodized aluminum, stainless steel, or other compatible material. (Carducci et al. at paragraph [0091].) Carducci et al. does not describe a construction for the processing chamber 100 including, among other features, a protective barrier layer that comprises at least one of Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

In removing Al_2O_3 from both claims 31 and 38, the Applicant has removed Carducci et al. as a reference that may be applied against these claims. Accordingly, the Applicant respectfully submits that Carducci et al. cannot be relied upon to anticipate any of claims 31, 36-38 and 43. Therefore, the Applicant respectfully requests that the Examiner withdraw the rejection under 35 U.S.C. § 102(e).

Next, the Applicant respectfully submits that claims 1, 7, 9, 17, 19, and 27 are patentably distinguishable over Okase et al. and Lingampalli because they recite a reduced maintenance processing system that includes, among other features, a chemical treatment system and a thermal treatment system with a protective barrier layer formed on at least a portion of an interior surface, the protective barrier layer

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comprising at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. None of the references cited by the Examiner discloses or suggests, either alone or in combination with one another, such a combination. As a result, the Applicant respectfully submits that the claims cannot be rendered obvious by the two references relied upon by the Examiner.

As noted by the Applicant in the Amendment filed on April 10, 2006, Okase et al. describes a worktable 36, below which there is a heat compensating member 66 that includes a thin ring plate 68 made of metal, such as stainless steel. (Okase et al. at col. 6, lines 43-51.) In place of stainless steel, the thin plate 68 may be formed of another heat-resistant and corrosion-resistant material such as a ceramic, e.g., Al_2O_3, an opaque quartz, and the like. (Okase et al. at col. 6, lines 51-54.) With respect to the thin plate 68, the Applicant respectfully points out that the thin plate 68 may be made from Al_2O_3, not provided with a protective barrier layer made of Al_2O_3. As noted in the Applicant's prior response, there is no discussion of any protective barrier layer on the thin plate 68. Moreover, as argued by the Applicant previously, it is unlikely that one skilled in the art would apply a protective barrier made from at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3 to the thin plate 68, if the thin plate 68 were made from Al_2O_3.

As recognized by the Examiner, Okase et al. does not describe a chemical and a thermal treatment chamber with a protective barrier formed at least on a portion of an interior surface. Without a discussion of a protective barrier, it stands to reason that there is also no discussion of a protective barrier that comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. As a result, Okase et al. fails to describe one or more of the features recited by the present claims. Accordingly, the Applicant respectfully submits that Okase et al. cannot be relied upon properly to reject any of claims 1, 7, 9, 17, 19, and 27.

Lingampalli does not cure the deficiencies noted with respect to the Okase et al. and, therefore, does not assist the Examiner with a rejection of the claims. Lingampalli describes an article for use in a semiconductor processing chamber and method of fabricating the same. The Lingampalli invention concerns a metal chemical vapor deposition system (MCVD) that has particular utility for protecting aluminum surfaces of substrate supports against reactions with fluorine and fluorine-

comprising fluids. (Lingampalli at col. 3, lines 20-30.) In the discussion of the chemical vapor deposition system 100, Lingampalli states that the walls 106 and bottom 108 are typically fabricated from a unitary block of aluminum. (Lingampalli at col. 3, lines 38-40.) The lid 110 is generally comprised of aluminum. (Lingampalli at col. 3, lines 45-46.) In addition, the showerhead 118 is typically fabricated from aluminum. (Lingampalli at col. 3, lines 51-52.) Also, the support assembly 138 is generally comprised of aluminum. (Lingampalli, col. 4, at lines 38-39.)

A protective coating 220 is typically disposed on at least the upper surface 216 of the support assembly 138. (Lingampalli at col. 5, lines 29-30.) The coating 220 is typically applied to the upper surface 216, but may also be applied to the purge ring 204 and/or alignment pins 206, either individually or as an assembly. (Lingampalli at col. 5, lines 30-38.) Optionally, the coating 220 may be applied to other aluminum surfaces within the chamber 102. (Lingampalli at col. 5, lines 38-40.) For example, the coating 220 may be applied to the chamber itself, the showerheads (including the gas distribution plates and faceplate), and the blocker plate, among others. (Lingampalli at col. 5, lines 40-42.)

The coating 220 generally comprises a layer of aluminum fluoride (AlF_3), magnesium fluoride (MgF_2) or other material that prevents penetration of fluoride and/or fluoride containing compounds therethrough. (Lingampalli at col. 5, lines 43-46.) Alternatively, a coating 602 may be used that is capable of resisting cracking, flaking and the like when exposed to aggressive materials, such as fluorine, while simultaneously protecting the underlying material from attack from the aggressive environment. (Lingampalli at col. 7, lines 24-33.) The coating 602 is generally identical to the coating 220. (Lingampalli at col. 7, lines 27-28.) The coating 602 is resistant to degradation in harsh environments such as environments containing NF_3. (Lingampalli at col. 7, lines 36-39.)

No-where in Lingampalli is there any discussion of a reduced maintenance processing system, a chemical treatment system, and a thermal treatment system that combine a number of features including, among them, a protective barrier layer that comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. In fact, the Applicant respectfully submits that the discussion in Lingampalli of aluminum fluoride (AlF_3) or magnesium fluoride (MgF_2) as the coatings 220, 602

that may be employed to resist degradation to a fluorine-containing environment would tend to lead those skilled in the art away from the combination recited by the claims. As a result, the Applicant respectfully submits that Lingampalli cannot be combined with the remaining references to render obvious any of claims 1, 7, 9, 17, 19, and 27.

Claims 2, 20, and 22 are patentably distinguishable over Okase et al., Lingampalli and Imafuku et al. because these depend from claim 1 (either directly or indirectly) and recite additional features. Accordingly, for the same reasons that Okase et al. and Lingampalli do not apply to claim 1, they do not apply to claims 2, 20, and 22. Imafuku et al. does not assist the Examiner with a rejection of claims 2, 20, and 22. As noted in the response filed on April 10, 2006, Imafuku et al. describes a vacuum processing device with a processing chamber 2 and an auxiliary vacuum chamber 3 connected to one another via a transfer port 20. (Imafuku et al. at paragraph [0017].) A gate liner 100 is provided at the inner wall of the transfer port 20, is detachable for cleaning, and is made of aluminum coated with an insulating film. (Imafuku et al. at paragraph [0022].) The insulating film is a rare earth oxide spray-deposited film that, in one embodiment, is made from Y_2O_3. (Imafuku et al. at paragraph [0022].) Use of a rare earth oxide spray-deposited film achieves a high degree of erosion resistance when exposed to a plasma. (Imafuku et al. at paragraph [0022].)

As is immediately apparent, Imafuku et al. does not describe, among other features, a reduced maintenance processing system that combines a chemical treatment system and a thermal treatment system with a protective barrier layer that comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. Moreover, the Applicant respectfully submits that the discussion of a Y_2O_3 coating on the gate liner 100, without more, does not provide a motivation for Imafuku et al. to be combined with the remaining references in the manner suggested by the Examiner. As a result, the Applicant respectfully submits that Imafuku et al. cannot be relied upon in combination with the remaining reference to render unpatentable any of claims 2, 20, and 22.

Next, the Applicant respectfully submits that claims 3 and 13 are patentably distinguishable over Okase et al. in view of Lingampalli and further in view of

Carducci et al. Claims 3 and 13 depend from claim 1. Accordingly, for the same reasons that Okase et al. and Lingampalli fail to render obvious claim 1, the references are equally inapplicable to claims 3 and 13. Carducci et al. does not assist the Examiner with a rejection of claims 3 and 13 because Carducci et al. does not cure the deficiencies noted with respect to Okase et al. and Lingampalli. Since Carducci et al. is discussed above, the Applicant does not present additional commentary with respect to that reference. The Applicant points out simply that Carducci et al. does not describe or suggest a reduced maintenance processing system that combines, among other features, a chemical and a thermal treatment chamber with a protective barrier formed at least on a portion of an interior surface, the protective barrier layer comprising at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. As a result, the combination of the three references cannot render obvious either of claims 3 and 13.

Claims 28 and 30 are patentably distinguishable over Okase et al. in view of Lingampalli and Perlov et al. because these claims depend either directly or indirectly from claim 1 and add features to those recited by claim 1. The deficiencies of Okase et al. and Lingampalli are discussed above. The Applicant respectfully submits that Perlov et al. does not cure the deficiencies noted with respect to these two references and, therefore, cannot be combined with those references to render claims 28 and 30 obvious. Like the other references, Perlov et al. fails to describe or suggest a reduced maintenance processing system, a chemical treatment system, and a thermal treatment system that combine a number of features including, among them, a protective barrier layer that comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3. Accordingly, the Applicant respectfully submits that claims 28 and 30 are patentable thereover.

Perlov et al. describes a method and apparatus for improved substrate handling. A chamber 11 contains a substrate carriage 13 and temperature adjustment plate 15. (Perlov et al. at paragraph [0026].) The substrate carriage 13 has three branches 19a-c, which include substrate supports 21a-b. (Perlov et al. at paragraph [0026].) The substrate supports 21a-b preferably are made of a ceramic such as alumina, quartz, or any other hard material that is compatible with semiconductor substrates. (Perlov et al. at paragraph [0027].) There is no discussion, however, of

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any protective barrier. Moreover, like the thin plate 68 discussed by Okase et al., it is unlikely that one skilled in the art would add a protective barrier to the substrate supports if made from alumina, for example. Accordingly, Perlov et al. does not assist the Examiner with a rejection of any of claims 28 and 30. As a result, the Applicant respectfully requests that the Examiner withdraw the rejections.

Each of the Examiner's rejections having been addressed, the Appllicant respectfully submits that claims 1-3, 7, 9, 13, 17, 19-20, 22, 27-28, 30-31, 36-38, and 43 are now in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw the rejections of the claims and pass this application quickly to issuance.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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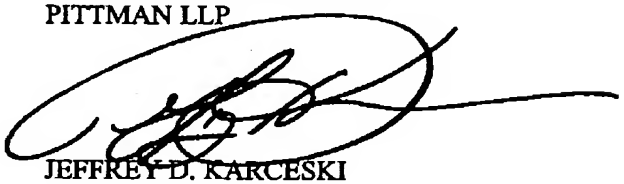

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